

What is claimed is:

1. In a computer network having a plurality of nodes each of which has a DDB and one of which should be master node used to maintain contents of said DDB in each of said plurality of nodes consistent throughout said plurality in a manner to avoid a single point of failure, said plurality of nodes including a first purported master node and a second purported master node, a system for resolving conflict in said network between said first purported master node and said second purported master node comprising:

means for establishing a standard for comparison between said first purported master node and said second purported master node;

means for comparing said first purported master node against said second purported master node in accordance with said standard to obtain comparison results;

and,

means for selecting said master node from the group of nodes consisting of said first purported master node and said second purported master node based on said comparison results.

2. The system of claim 1 and further comprising:

means for demoting the remaining node in said group to non-master node status as a participating node in said plurality of nodes.

1 3. The system of claim 1 and wherein said comparison standard establishing means  
2 establishes a temporal standard.

3  
4 4. The system of claim 3 and wherein said comparing means comprises:  
5 means for choosing between said first purported master node and said second  
6 purported master node if said first purported master node and said second purported  
7 master node were selected simultaneously; and,  
8 means for determining which one of said first purported master node and said  
9 second purported master node was most recently selected to obtain a most recently  
10 selected purported master node if said first purported master node and said second  
11 purported master node were not selected simultaneously.

12  
13 5. The system of claim 4 and wherein said choosing means includes IP means for  
14 picking said first purported master node if the IP address of said first purported master  
15 node is lower than the IP address of said second purported master node and vice versa.

16  
17 6. The system of claim 4 and wherein said determining means comprises means for  
18 picking said most recently selected purported master node as said master node.

19  
20 7. The system of claim 6 and wherein said picking means comprises:  
21 first means for determining when said first purported master node was selected  
22 master of said network to obtain a first time of selection;

1           second means for determining when said second purported master node was  
2           selected said master of said network to obtain a second time of selection;  
3           third means for comparing said first time with said second time to obtain said  
4           most recently selected purported master node; and,  
5           fourth means, responsive to operation of said third means, for allowing said most  
6           recently selected purported master node to be said master node and for demoting other  
7           than said most recently selected master node to non-master-node status as a participating  
8           node in said plurality of nodes.

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10       8.       The system of claim 7 and wherein said first means comprises:

11           fifth means, included within said first purported master node for recording first  
12           purported master node local time of selection of said first purported master node as said  
13           master node as recorded said first time of selection, for measuring duration of said  
14           selection of said first purported master node to obtain a first selection duration, and for  
15           communicating said first selection duration to all other of said nodes in said plurality.

16  
17       9.       The system of claim 8 and wherein said second means comprises:

18           sixth means, included within said second purported master node for recording  
19           second purported master node local time of selection of said second purported master  
20           node as said master node as recorded said second time of selection, for measuring  
21           duration of said selection of said second purported master node to obtain a second  
22           selection duration, and for communicating said second selection duration to all other of  
23           said nodes in said plurality.

1  
2 10. The system of claim 9 and wherein said third means comprises, for and within  
3 each one of said plurality of nodes other than said first purported master node and said  
4 second purported master node:

5 seventh means, for noting local time of receipt of communication of said first  
6 selection duration and for subtracting said first selection duration from said local time of  
7 receipt of said first selection duration to obtain first adjusted local time;

8 eighth means for noting local time of receipt of communication of said second  
9 selection duration and for subtracting said second selection duration from said local time  
10 of receipt of said second selection duration to obtain second adjusted local time;

11 ninth means for comparing said first adjusted local time and said second adjusted  
12 local time to determine most recent adjusted local time; and,

13 tenth means for identifying either said first purported master node or said second  
14 purported master node associated with said most recent adjusted local time.  
15

16 11. The system of claim 10 and wherein said third means further comprises:

17 eleventh means located within said first purported master node  
18 comprising;

19 twelfth means for noting local time of arrival of said second selection  
20 duration and for subtracting said second selection duration therefrom to obtain  
21 first purported master node adjusted competitive local time;

thirteenth means for comparing said first purported master node adjusted competitive local time with said first purported master node local time of selection to obtain a first most recent selection time; and,

fourteenth means for identifying either said first purported master node or said second purported master node associated with said first most recent selection time.

12. The system of claim 11 and wherein said third means further comprises:

fifteenth means located within said second purported master node comprising;

sixteenth means for noting local time of arrival of said first selection duration and for subtracting said first selection duration therefrom to obtain second purported master node adjusted competitive local time;

seventeenth means for comparing said second purported master node adjusted competitive local time with said second purported master node local time of selection to obtain a second most recent selection time; and,

eighteenth means for identifying either said first purported master node or said second purported master node associated with said second most recent selection time.

13. The system of claim 12 and further comprising:

summation means, operative with said tenth means, said fourteenth means and said eighteenth means for tallying the number of times said first purported master node is

1 identified to obtain a first total and the number of times said second purported master  
2 node is identified to obtain a second total;

3 if said first total equals said second total, tiebreaking means for choosing between  
4 said first purported master node and said second purported master node; and,

5 if said first total does not equal said second total, final master node selection  
6 means for selecting said first purported master node as master node if said first total is  
7 greater than said second total and for selecting said second purported master node as  
8 master node if said second total is greater than said first total.

9  
10 14. The system of claim 13 and wherein said tiebreaking means includes other IP  
11 means for picking said first purported master node as said master node if the IP address  
12 of said first purported master node is lower than the IP address of said second purported  
13 master node and vice versa.

14  
15 15. The system of claim 13 and wherein said final master node selection means  
16 includes demoting means for demoting said first purported master node to non-master  
17 node status as a participating node within said plurality of nodes if said first total is less  
18 than said second total, and for demoting said second purported master node to non-master  
19 node status as a participating node within said plurality of nodes if said second total is  
20 less than said first total.

16. The system of claim 8 and wherein said fifth means includes means for communicating via said DDB in said first purported master node to said DDB in each of said all other of said nodes in said plurality.

17. The system of claim 9 and wherein said sixth means includes means for communicating via said DDB in said second purported master node to said DDB in each of said all other of said nodes in said plurality.

18. The system of claim 1 and wherein said network is globally-dispersed and at least some of said plurality of nodes are located in different time zones from other of said plurality of nodes.

19. In a computer network having a plurality of nodes only one of which should be master node for managing said plurality of nodes in a manner to avoid a single point of failure, said plurality of nodes including a first purported master node and a second purported master node, a system for resolving conflict in said network between said first purported master node and said second purported master node comprising:

means for choosing between said first purported master node and said second purported master node to obtain said master node.

20. In a computer network having a plurality of nodes only one of which should be master node used to maintain said plurality of nodes in a manner to avoid a single point of failure, said plurality of nodes including a first purported master node and a second purported master node, a system for resolving conflict in said network between said first purported master node and said second purported master node comprising:

means for establishing a standard for comparison between said first purported master node and said second purported master node;

means for comparing said first purported master node against said second purported master node in accordance with said standard to obtain comparison results;

and,

means for selecting said master node from the group of nodes consisting of said first purported master node and said second purported master node based on said comparison results.

21. In a computer network having a plurality of nodes each of which has a DDB and one of which should be master node used to maintain contents of said DDB in each of said plurality of nodes consistent throughout said plurality in a manner to avoid a single point of failure, said plurality of nodes including a first purported master node and a second purported master node, a method for resolving conflict in said network between said first purported master node and said second purported master node comprising:

establishing a standard for comparison between said first purported master node and said second purported master node;



1 comparing said first purported master node against said second purported master  
2 node in accordance with said standard to obtain comparison results; and,  
3 selecting said master node from the group of nodes consisting of said first  
4 purported master node and said second purported master node based on said comparison  
5 results.

6  
7 22. The method of claim 21 and further comprising:  
8 demoting the remaining node in said group to non-master node status as a  
9 participating node in said plurality of nodes.

10  
11 23. The method of claim 21 and wherein said comparison standard establishing  
12 establishes a temporal standard.

13  
14 24. The method of claim 23 and wherein said comparing comprises:  
15 choosing between said first purported master node and said second purported  
16 master node if said first purported master node and said second purported master node  
17 were selected simultaneously; and,  
18 determining which one of said first purported master node and said second  
19 purported master node was most recently selected to obtain a most recently selected  
20 purported master node if said first purported master node and said second purported  
21 master node were not selected simultaneously.

22

1    25.    The method of claim 24 and wherein said choosing includes picking said first  
2    purported master node if the IP address of said first purported master node is lower than  
3    the IP address of said second purported master node and vice versa.

4  
5    26.    The method of claim 24 and wherein said determining comprises picking said  
6    most recently selected purported master node as said master node.

7  
8    27.    The method of claim 6 and wherein said picking comprises:  
9           first determining when said first purported master node was selected master of  
10    said network to obtain a first time of selection;  
11           second determining when said second purported master node was selected said  
12    master of said network to obtain a second time of selection;  
13           third comparing said first time with said second time to obtain said most recently  
14    selected purported master node; and,  
15           allowing said most recently selected purported master node to be said master node  
16    and demoting other than said most recently selected master node to non-master-node  
17    status as a participating node in said plurality of nodes.

18  
19    28.    The method of claim 27 and wherein said first determining comprises:  
20           recording first purported master node local time of selection of said first purported  
21    master node as said master node as recorded said first time of selection;  
22           measuring duration of said selection of said first purported master node to obtain  
23    a first selection duration; and,

1 communicating said first selection duration to all other of said nodes in said  
2 plurality.

3  
4 29. The method of claim 28 and wherein said second determining comprises:

5 recording second purported master node local time of selection of said second  
6 purported master node as said master node as recorded said second time of selection;

7 measuring duration of said selection of said second purported master node to  
8 obtain a second selection duration; and,

9 communicating said second selection duration to all other of said nodes in said  
10 plurality.

11  
12 30. The method of claim 29 to be practiced within each one of said plurality of nodes  
13 other than said first purported master node and said second purported master node  
14 comprising:

15 noting local time of receipt of communication of said first selection duration and  
16 subtracting said first selection duration from said local time of receipt of said first  
17 selection duration to obtain first adjusted local time;

18 noting local time of receipt of communication of said second selection duration  
19 and subtracting said second selection duration from said local time of receipt of said  
20 second selection duration to obtain second adjusted local time;

21 comparing said first adjusted local time and said second adjusted local time to  
22 determine most recent adjusted local time; and,

1 identifying either said first purported master node or said second purported master  
2 node associated with said most recent adjusted local time.

3  
4 31. The method of claim 30 to be practiced within said first purported master node  
5 comprising:

6 noting local time of arrival of said second selection duration and subtracting said  
7 second selection duration therefrom to obtain first purported master node adjusted  
8 competitive local time;

9 comparing said first purported master node adjusted competitive local time with  
10 said first purported master node local time of selection to obtain a first most recent  
11 selection time; and,

12 identifying either said first purported master node or said second purported master  
13 node associated with said first most recent selection time.

14  
15 32. The method of claim 31 to be practiced within said second purported  
16 master node comprising:

17 noting local time of arrival of said first selection duration and subtracting said  
18 first selection duration therefrom to obtain second purported master node adjusted  
19 competitive local time;

20 comparing said second purported master node adjusted competitive local time  
21 with said second purported master node local time of selection to obtain a second most  
22 recent selection time; and,

1 identifying either said first purported master node or said second purported master  
2 node associated with said second most recent selection time.

3  
4 33. The method of claim 32 comprising:

5 tallying the number of times said first purported master node is identified to  
6 obtain a first total and the number of times said second purported master node is  
7 identified to obtain a second total;

8 if said first total equals said second total, tiebreaking by choosing between said  
9 first purported master node and said second purported master node; and,

10 if said first total does not equal said second total, final master node selection  
11 selecting said first purported master node as master node if said first total is greater than  
12 said second total and selecting said second purported master node as master node if said  
13 second total is greater than said first total.

14  
15 34. The method of claim 33 and wherein said tiebreaking by choosing includes  
16 picking said first purported master node as said master node if the IP address of said first  
17 purported master node is lower than the IP address of said second purported master node  
18 and vice versa.

19  
20 35. The method of claim 33 including:

21 demoting said first purported master node to non-master node status as a  
22 participating node within said plurality of nodes if said first total is less than said second  
23 total; and,

1 demoting said second purported master node to non-master node status as a  
2 participating node within said plurality of nodes if said second total is less than said first  
3 total.

4  
5 36. The method of claim 28 including:

6 communicating via said DDB in said first purported master node to said DDB in  
7 each of said all other of said nodes in said plurality.

8  
9 37. The method of claim 29 including:

10 communicating via said DDB in said second purported master node to said DDB  
11 in each of said all other of said nodes in said plurality.

12  
13 38. The method of claim 21 and wherein said network is globally-dispersed and at  
14 least some of said plurality of nodes are located in different time zones from other of said  
15 plurality of nodes.

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17  
18 39. In a computer network having a plurality of nodes only one of which should be  
19 master node for managing said plurality of nodes in a manner to avoid a single point of  
20 failure, said plurality of nodes including a first purported master node and a second  
21 purported master node, a method for resolving conflict in said network between said first  
22 purported master node and said second purported master node comprising:

1 choosing between said first purported master node and said second purported  
2 master node to obtain said master node.

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4  
5 40. In a computer network having a plurality of nodes only one of which should be  
6 master node used to maintain said plurality of nodes in a manner to avoid a single point  
7 of failure, said plurality of nodes including a first purported master node and a second  
8 purported master node, a method for resolving conflict in said network between said first  
9 purported master node and said second purported master node comprising:

10 establishing a standard for comparison between said first purported master node  
11 and said second purported master node;

12 comparing said first purported master node against said second purported master  
13 node in accordance with said standard to obtain comparison results; and,

14 selecting said master node from the group of nodes consisting of said first  
15 purported master node and said second purported master node based on said comparison  
16 results.

17  
18  
19 41. A computer program product for use in a computer network having a plurality of  
20 nodes each of which has a DDB and one of which should be master node used to  
21 maintain contents of said DDB in each of said plurality of nodes consistent throughout  
22 said plurality in a manner to avoid a single point of failure, said plurality of nodes  
23 including a first purported master node and a second purported master node, said

1 computer program product including a computer usable medium having computer  
2 readable program code thereon for resolving conflict in said network between said first  
3 purported master node and said second purported master node, said program code  
4 comprising:  
5 program code for establishing a standard for comparison between said first  
6 purported master node and said second purported master node;  
7 program code for comparing said first purported master node against said second  
8 purported master node in accordance with said standard to obtain comparison results;  
9 and,  
10 program code for selecting said master node from the group of nodes consisting  
11 of said first purported master node and said second purported master node based on said  
12 comparison results.

13  
14 42. The computer program product of claim 41 and further comprising:

15 program code for demoting the remaining node in said group to non-master node  
16 status as a participating node in said plurality of nodes.

17  
18 43. The computer program product of claim 41 and wherein said comparison standard  
19 establishing program code establishes a temporal standard.

20  
21 44. The computer program product of claim 43 and wherein said comparing program  
22 code comprises:



1           program code for choosing between said first purported master node and said  
2   second purported master node if said first purported master node and said second  
3   purported master node were selected simultaneously; and,  
4           program code for determining which one of said first purported master node and  
5   said second purported master node was most recently selected to obtain a most recently  
6   selected purported master node if said first purported master node and said second  
7   purported master node were not selected simultaneously.

8  
9   45.    The computer program product of claim 44 and wherein said choosing program  
10   code includes IP program code for picking said first purported master node if the IP  
11   address of said first purported master node is lower than the IP address of said second  
12   purported master node and vice versa.

13  
14   46.    The computer program product of claim 44 and wherein said determining  
15   program code comprises program code for picking said most recently selected purported  
16   master node as said master node.

17  
18   47.    The computer program product of claim 46 and wherein said picking program  
19   code comprises:

20           first program code for determining when said first purported master node was  
21   selected master of said network to obtain a first time of selection;

22           second program code for determining when said second purported master node  
23   was selected said master of said network to obtain a second time of selection;

1           third program code for comparing said first time with said second time to obtain  
2   said most recently selected purported master node; and,  
3           fourth means, responsive to operation of said third means, for allowing said most  
4   recently selected purported master node to be said master node and for demoting other  
5   than said most recently selected master node to non-master-node status as a participating  
6   node in said plurality of nodes.

7  
8   48.     The computer program product of claim 47 and wherein said first program code  
9   comprises:

10          fifth means, included within said first purported master node for recording first  
11   purported master node local time of selection of said first purported master node as said  
12   master node as recorded said first time of selection, for measuring duration of said  
13   selection of said first purported master node to obtain a first selection duration, and for  
14   communicating said first selection duration to all other of said nodes in said plurality.

15  
16   49.     The computer program product of claim 48 and wherein said second program  
17   code comprises:

18          sixth means, included within said second purported master node for recording  
19   second purported master node local time of selection of said second purported master  
20   node as said master node as recorded said second time of selection, for measuring  
21   duration of said selection of said second purported master node to obtain a second  
22   selection duration, and for communicating said second selection duration to all other of  
23   said nodes in said plurality.

1  
2 50. The computer program product of claim 49 and wherein said third program code  
3 comprises, for and within each one of said plurality of nodes other than said first  
4 purported master node and said second purported master node:

5 seventh means, for noting local time of receipt of communication of said first  
6 selection duration and for subtracting said first selection duration from said local time of  
7 receipt of said first selection duration to obtain first adjusted local time;

8 eighth program code for noting local time of receipt of communication of said  
9 second selection duration and for subtracting said second selection duration from said  
10 local time of receipt of said second selection duration to obtain second adjusted local  
11 time;

12 ninth program code for comparing said first adjusted local time and said second  
13 adjusted local time to determine most recent adjusted local time; and,

14 tenth program code for identifying either said first purported master node or said  
15 second purported master node associated with said most recent adjusted local time.  
16

17 51. The computer program product of claim 50 and wherein said third program code  
18 further comprises:

19 eleventh program code located within said first purported master node  
20 comprising;

21 twelfth program code for noting local time of arrival of said second  
22 selection duration and for subtracting said second selection duration therefrom to  
23 obtain first purported master node adjusted competitive local time;

1           thirteenth program code for comparing said first purported master node  
2           adjusted competitive local time with said first purported master node local time of  
3           selection to obtain a first most recent selection time; and,

4           fourteenth program code for identifying either said first purported master  
5           node or said second purported master node associated with said first most recent  
6           selection time.

7  
8   52.    The computer program product of claim 51 and wherein said third program code  
9   further comprises:

10           fifteenth program code located within said second purported master node  
11           comprising;

12           sixteenth program code for noting local time of arrival of said first  
13           selection duration and for subtracting said first selection duration therefrom to  
14           obtain second purported master node adjusted competitive local time;

15           seventeenth program code for comparing said second purported master  
16           node adjusted competitive local time with said second purported master node  
17           local time of selection to obtain a second most recent selection time; and,

18           eighteenth program code for identifying either said first purported master  
19           node or said second purported master node associated with said second most  
20           recent selection time.

21  
22   53.    The computer program product of claim 52 and further comprising:

1 summation means, operative with said tenth means, said fourteenth program code  
2 and said eighteenth program code for tallying the number of times said first purported  
3 master node is identified to obtain a first total and the number of times said second  
4 purported master node is identified to obtain a second total;

5 if said first total equals said second total, tiebreaking program code for choosing  
6 between said first purported master node and said second purported master node; and,

7 if said first total does not equal said second total, final master node selection  
8 program code for selecting said first purported master node as master node if said first  
9 total is greater than said second total and for selecting said second purported master node  
10 as master node if said second total is greater than said first total.

11  
12 54. The computer program product of claim 53 and wherein said tiebreaking program  
13 code includes other IP program code for picking said first purported master node as said  
14 master node if the IP address of said first purported master node is lower than the IP  
15 address of said second purported master node and vice versa.

16  
17 55. The computer program product of claim 53 and wherein said final master node  
18 selection program code includes demoting program code for demoting said first  
19 purported master node to non-master node status as a participating node within said  
20 plurality of nodes if said first total is less than said second total, and for demoting said  
21 second purported master node to non-master node status as a participating node within  
22 said plurality of nodes if said second total is less than said first total.

56. The computer program product of claim 48 and wherein said fifth program code includes program code for communicating via said DDB in said first purported master node to said DDB in each of said all other of said nodes in said plurality.

57. The computer program product of claim 49 and wherein said sixth program code includes program code for communicating via said DDB in said second purported master node to said DDB in each of said all other of said nodes in said plurality.

58. The computer program product of claim 41 and wherein said network is globally-dispersed and at least some of said plurality of nodes are located in different time zones from other of said plurality of nodes.

59. A computer program product for use in a computer network having a plurality of nodes only one of which should be master node for managing said plurality of nodes in a manner to avoid a single point of failure, said plurality of nodes including a first purported master node and a second purported master node, said computer program product including a computer usable medium having computer readable program code thereon for resolving conflict in said network between said first purported master node and said second purported master node, said program code comprising:

program code for choosing between said first purported master node and said second purported master node to obtain said master node.

1  
2 60. A computer program product for use in a computer network having a plurality of  
3 nodes only one of which should be master node used to maintain said plurality of nodes  
4 in a manner to avoid a single point of failure, said plurality of nodes including a first  
5 purported master node and a second purported master node, said computer program  
6 product including a computer usable medium having computer readable code thereon for  
7 resolving conflict in said network between said first purported master node and said  
8 second purported master node, said program code comprising:

9 program code for establishing a standard for comparison between said first  
10 purported master node and said second purported master node;

11 program code for comparing said first purported master node against said second  
12 purported master node in accordance with said standard to obtain comparison results;  
13 and,

14 program code for selecting said master node from the group of nodes consisting  
15 of said first purported master node and said second purported master node based on said  
16 comparison results.

17  
18  
19 61. In a computer network having a plurality of nodes each of which has a DDB and  
20 one of which should be master node used to maintain contents of said DDB in each of  
21 said plurality of nodes consistent throughout said plurality in a manner to avoid a single  
22 point of failure, said plurality of nodes including a first purported master node and a

1 second purported master node, apparatus for resolving conflict in said network between  
2 said first purported master node and said second purported master node comprising:

3 a first device that establishes a standard for comparison between said first  
4 purported master node and said second purported master node;

5 a second device that compares said first purported master node against said  
6 second purported master node in accordance with said standard to obtain comparison  
7 results; and,

8 a third device that selects said master node from the group of nodes consisting of  
9 said first purported master node and said second purported master node based on said  
10 comparison results.

11  
12  
13 62. In a computer network having a plurality of nodes only one of which should be  
14 master node for managing said plurality of nodes in a manner to avoid a single point of  
15 failure, said plurality of nodes including a first purported master node and a second  
16 purported master node, apparatus for resolving conflict in said network between said first  
17 purported master node and said second purported master node comprising:

18 a device that chooses between said first purported master node and said second  
19 purported master node to obtain said master node.

20  
21  
22 63. In a computer network having a plurality of nodes only one of which should be  
23 master node used to maintain said plurality of nodes in a manner to avoid a single point



1 of failure, said plurality of nodes including a first purported master node and a second  
2 purported master node, apparatus for resolving conflict in said network between said first  
3 purported master node and said second purported master node comprising:

4 a first device that establishes a standard for comparison between said first  
5 purported master node and said second purported master node;

6 a second device that compares said first purported master node against said  
7 second purported master node in accordance with said standard to obtain comparison  
8 results; and,

9 a third device that selects said master node from the group of nodes consisting of  
10 said first purported master node and said second purported master node based on said  
11 comparison results.